Ordering number : EN4090B

Monolithic Linear IC

No. 4090B

SANYO

LA4450

Two Channel Power IC for Bus or Track Use in TV and Home Audio Applications

Overview

The LA4450 is a single package two channel power IC that supports an operating voltage of 26 V. It is particularly well suited for use as the bus or track power IC in car stereo applications. Additionally, since the LA4450 can drive 4 Ω loads, it can be used effectively in high-power high-end products. Furthermore, since it supports a high operating voltage and has low distortion, it is also optimal for use in TV and home audio products.

Functions

- Standby switch (active on high (+5 V) input)
- On-chip impulse noise protection circuit
- On-chip thermal protection circuit
- On-chip overvoltage and surge protection circuits

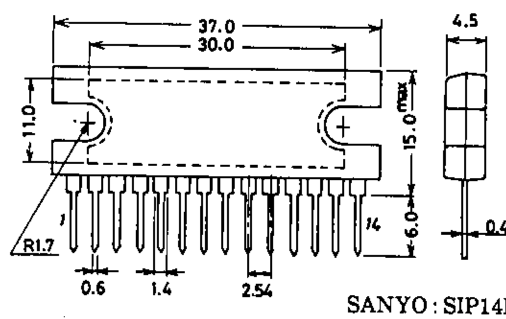
Features

- Two channels in a single package
- P_O = 12 W × 2 (V_{CC} = 26.4 V, R_L = 8 Ω, THD = 10%)
- P_O = 20 W × 2 (V_{CC} = 26.4 V, R_L = 4 Ω, THD = 10%)
- Can drive 4 Ω speakers
- Built-in standby switch
- Minimizes impulse noises

Package Dimensions

unit: mm

3023A-SIP14H



SANYO : SIP14H

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Condition	Rating	Unit
Maximum supply voltage	V_{CC} max	Rg = 0 (no signal)	37	V
Maximum output current	I_O peak		4	A
Allowable power dissipation	Pd max*	Infinite heat sink	25	W
Operating temperature	Topr		–35 to +80	°C
Storage temperature	Tstg		–40 to +150	°C

Note: * Set V_{CC} and R_L within ranges that do not cause Pd max to exceed 25 W.
(When V_{CC} is 37 V, R_L should be 6 Ω or larger and when V_{CC} is 35 V, R_L should be 4 Ω or larger.)

Operating Conditions at Ta = 25°C

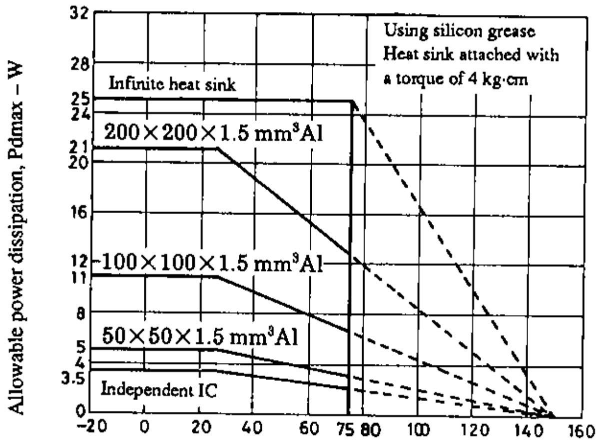
Parameter	Symbol	Condition	Rating	Unit
Recommended supply voltage	V_{CC}		26.4	V
Recommended load resistance	R_L		8	Ω
Operating supply voltage range	V_{CC}op		10 to 30	V

SANYO Electric Co., Ltd. Semiconductor Business Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

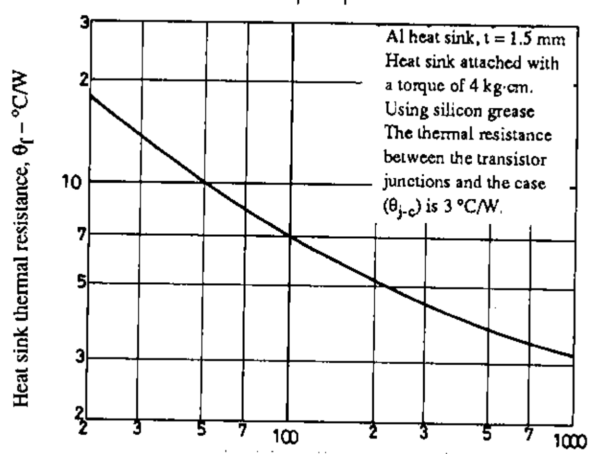
Operating Characteristics at Ta = 25°C, V_{CC} = 26.4 V, R_L = 8 Ω, f = 1 kHz, Rg = 600 Ω

Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Standby current	Ist	Standby switch off		1	30	μA
Quiescent current	I_{CCO}	Rg = 0	50	80	140	mA
Output Power	P_{O1}	THD = 10%	10	12		W
	P_{O2}	THD = 10%, R_L = 4 Ω		20		W
Voltage gain	VG	V_O = 0 dBm	49	51	53	dB
Total harmonic distortion	THD	P_O = 1 W		0.07	0.4	%
Output noise voltage	V_{NO}	Rg = 0, BPF-BW = 20 Hz to 20 kHz		0.4	1.0	mV
Ripple exclusion ratio	SVRR	Rg = 0, f_R = 100 Hz, V_R = 0 dBm	45	55		dB
Channel separation	CHsep	V_O = 0 dBm, Rg = 10 kΩ	45	55		dB
Standby control voltage	Vst	With a 10 kΩ resistor connected at pin 12	2.5		V_{CC}	V

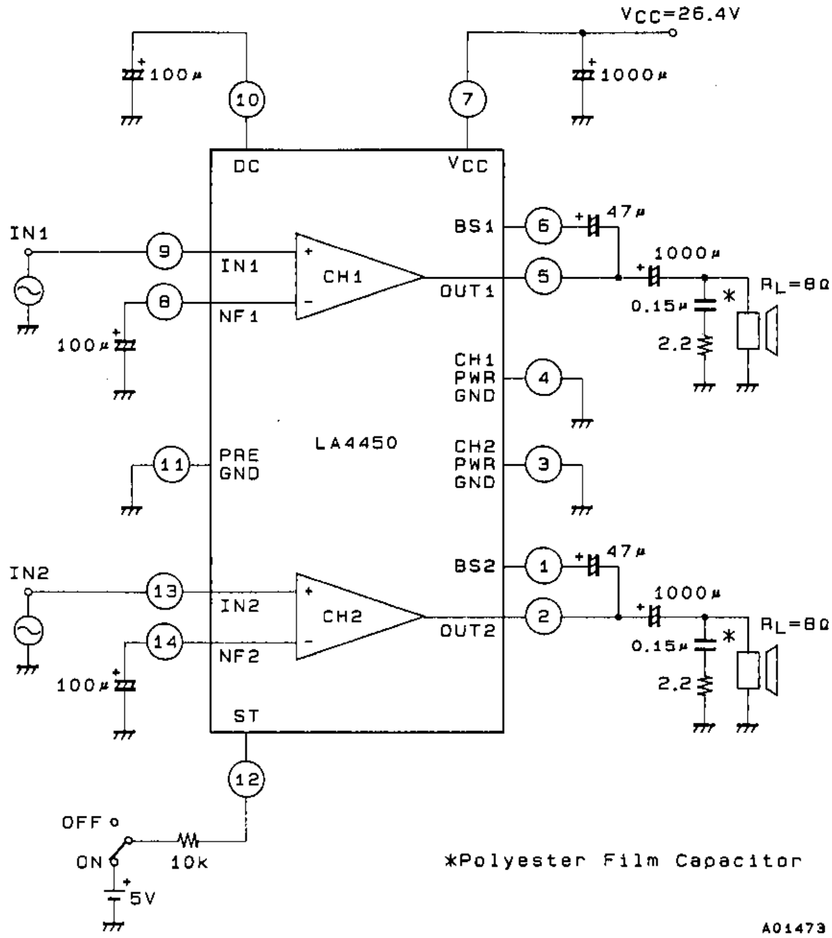
Pd max – Ta



θ_f – S_f



Test Circuit

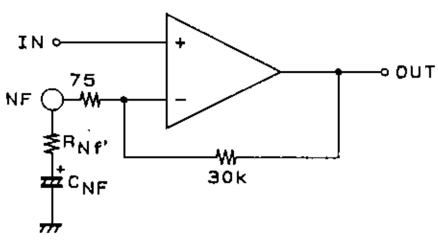


Unit (resistance: Ω, capacitance: F)

1. Features and Usage Notes

- Pin 12 is the standby pin. The IC operates when a voltage of 2 V or higher is applied through the external resistor R1. Note that the maximum influx current to pin 12 is 500 µA.
- Changing the voltage gain

Unit (resistance: Ω, capacitance: F)



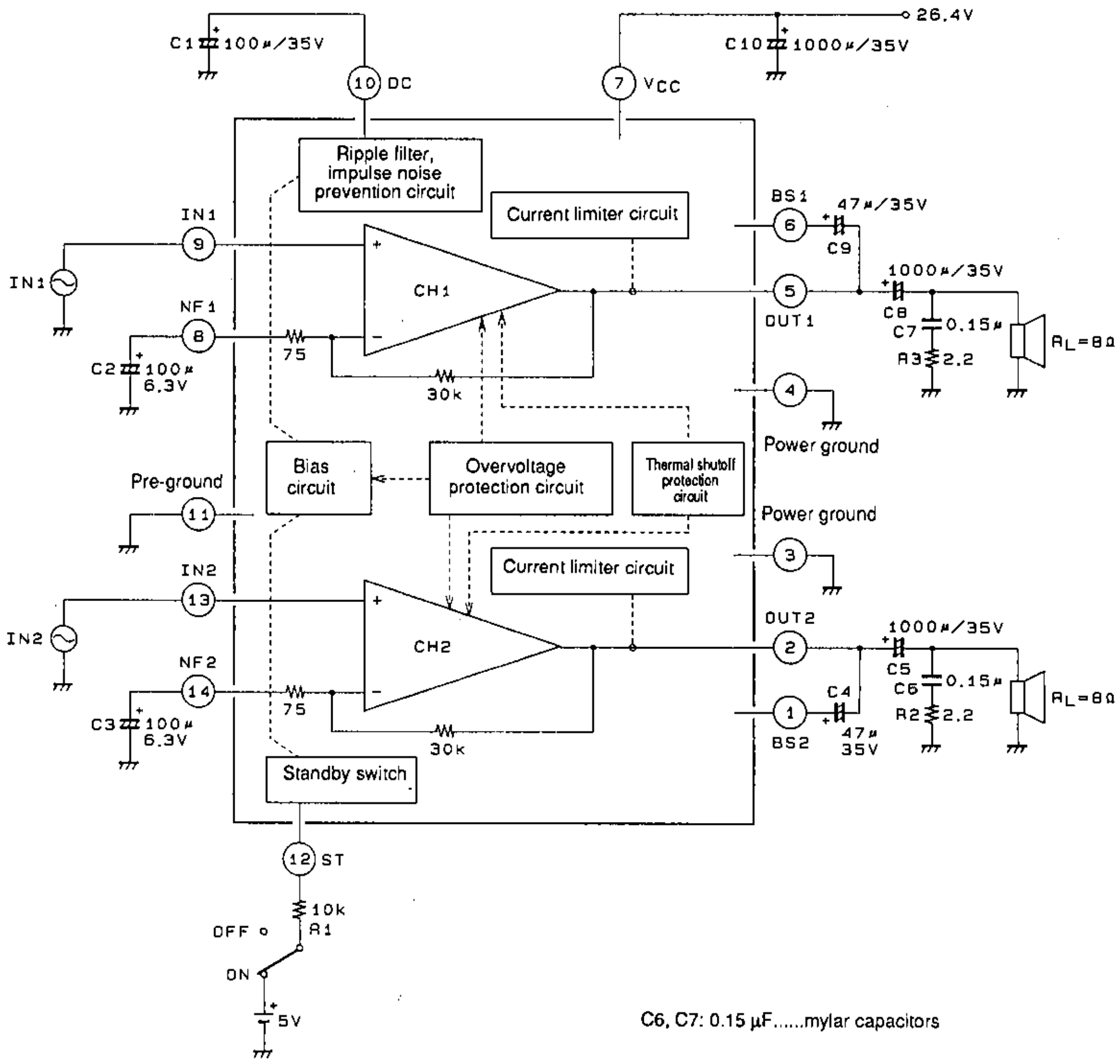
The voltage gain VG can be lowered by connecting an external resistor in series between the NF pin (pins 8 and 14) and C_{NF}.

$$VG = 20 \log \frac{30\ k\Omega}{75 + R_{Nf'}}$$

However, since the IC may oscillate if VG is 30 dB or lower, use a VG of 36 dB or higher.

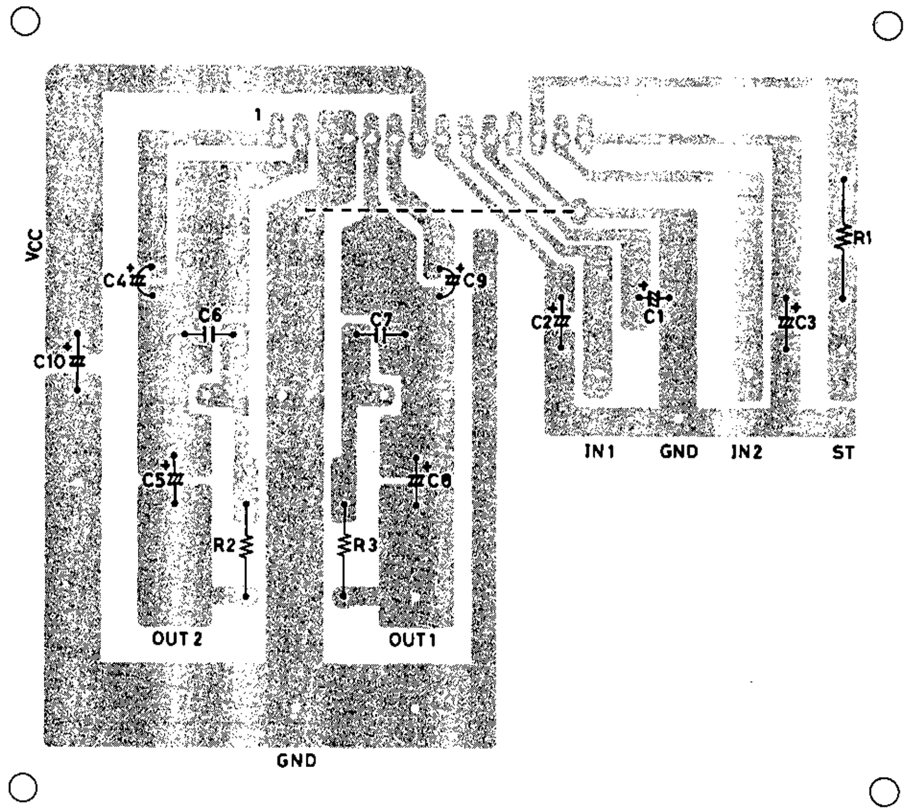
- The LA4450 includes a thermal protection circuit to prevent damage to or destruction of the IC due to abnormal overheating. As a result, the output may be attenuated or cut off if the application heat sinking is inadequate.
- The LA4450 includes an overvoltage protection circuit to protect the IC against power supply surges and abnormal voltages. This circuit has hysteresis characteristics: it operates at between 39 and 40 V, and recovers at around 34 V.
- Although the LA4450 includes a current limiter circuit to prevent damage due to abnormal currents, care must still be exercised to prevent load shorts and other excessive current conditions.

Application Circuit Diagram

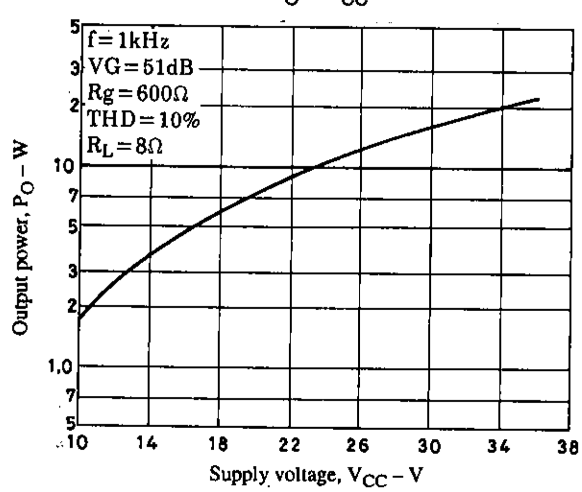


Unit (resistance: Ω, capacitance: F)

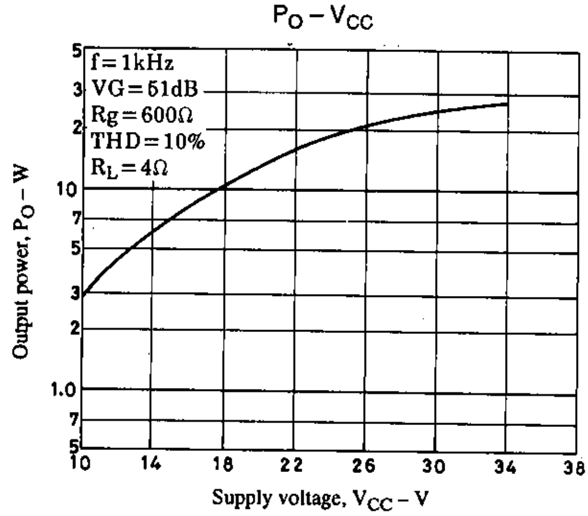
Printed Circuit Board Pattern Example



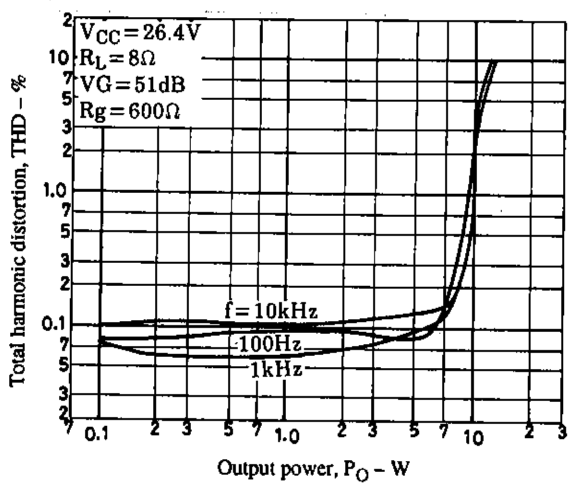
$P_O - V_{CC}$



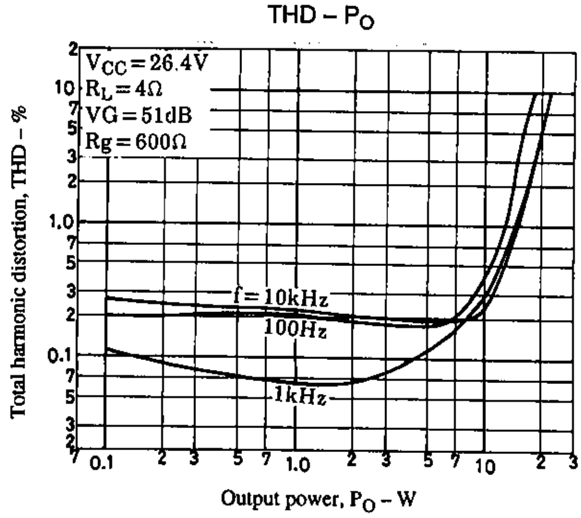
$P_O - V_{CC}$



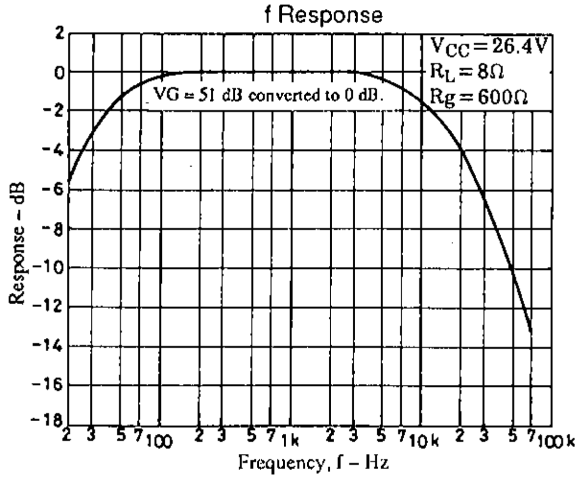
$THD - P_O$



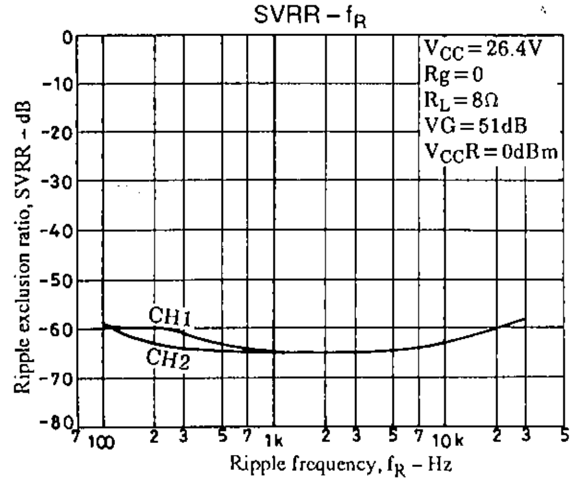
$THD - P_O$



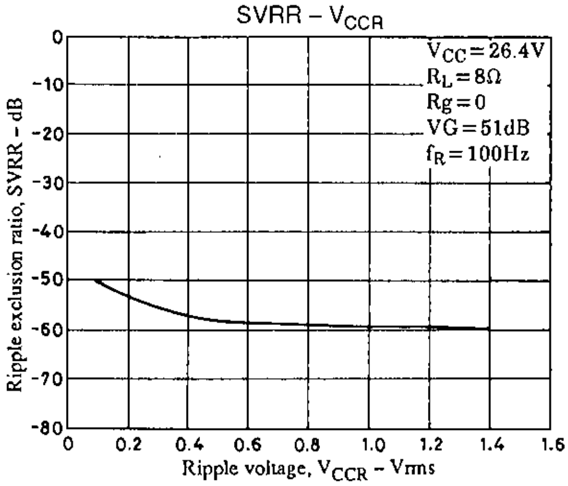
f Response



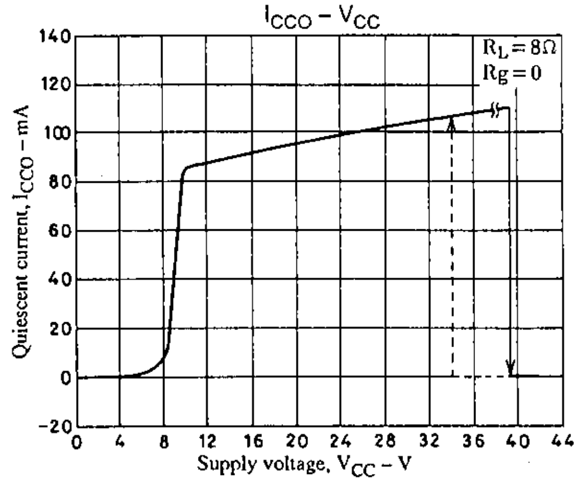
SVRR – f_R



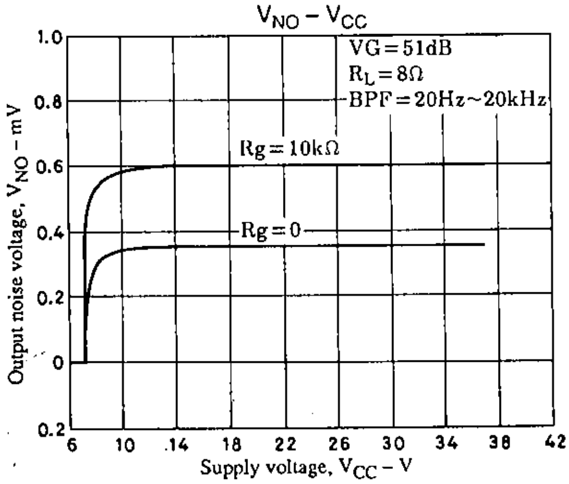
SVRR – V_{CCR}



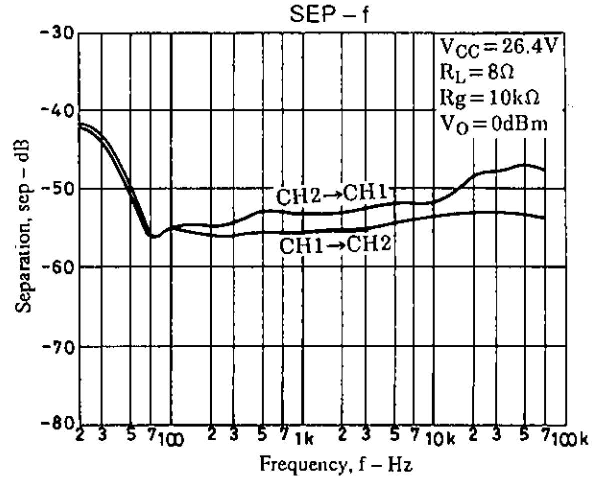
I_{CCO} – V_{CC}



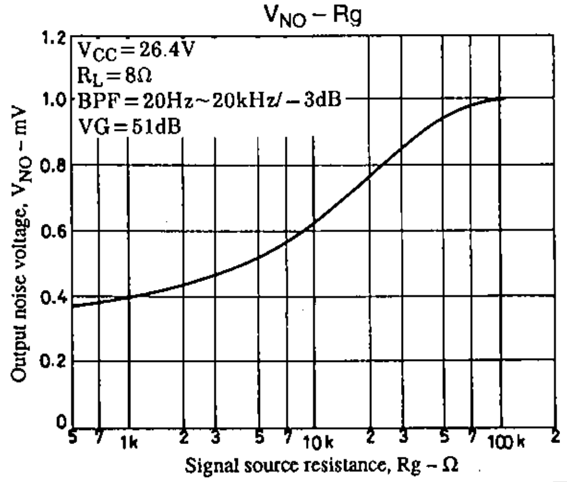
V_{NO} – V_{CC}



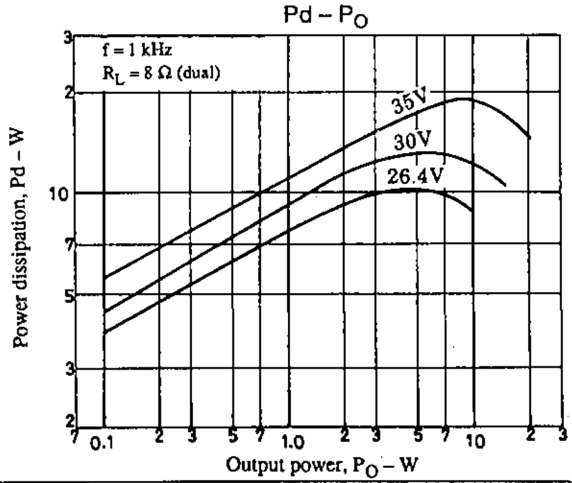
SEP – f

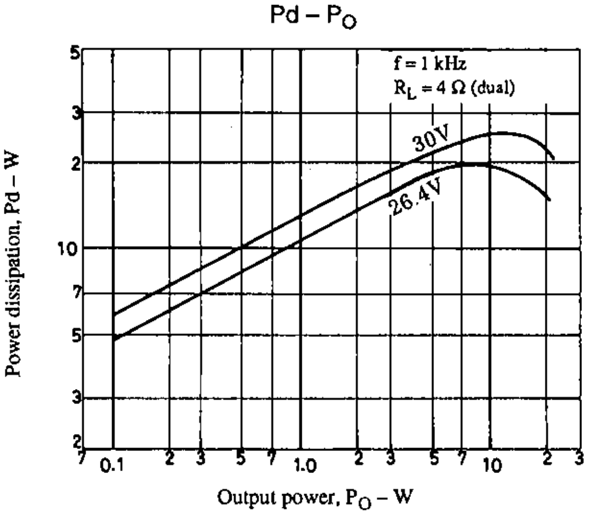


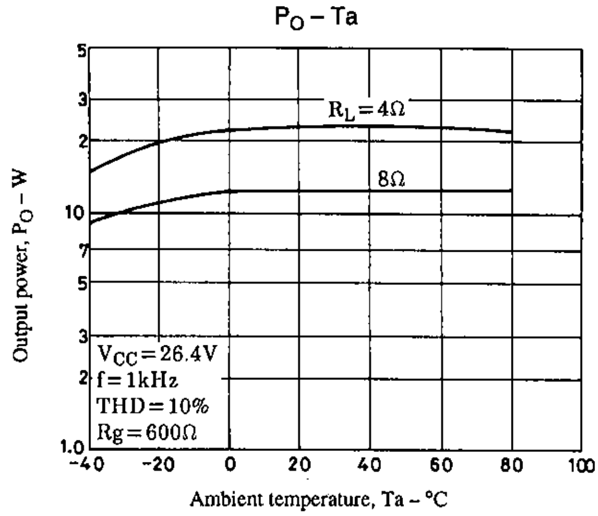
V_{NO} – Rg

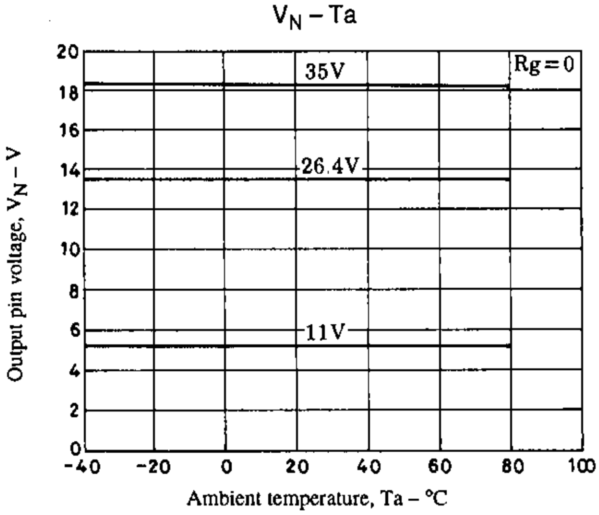


Pd – P_O









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